SYLLABUS

BIOC 201 - INTRODUCTORY BIOLOGY - FALL 2014

Goal of the course:

Develop critical insight into basic biological mechanisms of biochemistry, cell biology, genetics, and development of animals and plants through exploration of initial observations, definition of problems and questions, construction and testing of hypotheses, and analysis of the results of experiments.

Schedule:

Class	Date	Subject	Pages in "Campbell Biology ", 10th edition
1	8/25	How do biological molecules come together?	28-75
2	8/27	How do lipids and macromolecules such as proteins, polysaccharides, and nucleic acids each form specific 3D structures?	75-87
3	8/29	How are proteins folded into native shapes inside cells?	87-91, 141-151
4	9/03	How do enzymes catalyze chemical reactions and how is enzyme activity regulated?	151-161
5	9/05	How do proteins transport molecules across membranes and how are chemical gradients created and used during transport?	124-140
6	9/08	How do eukaryotic cells create and maintain separate functional compartments?	92-112
7	9/10	**In-Class Discussion Session 1**	
8	9/12	How do eukaryotes generate directed movement inside and outside cells?	112-123
9	9/15	How do cells generate ATP from oxidation-reduction reactions?	162-184
10	9/17	**In-Class Discussion Session 2**	
11	9/19	How are signals transduced across cell membranes and transmitted inside cells?	210-227
12	9/22	How do cells duplicate and divide or undergo apoptosis?	227-250

13	9/24	**In-Class Discussion Session 3**	
14	9/26	How is genetic diversity generated during sexual reproduction?	251-291
15	9/29	How is chromosomal information inherited as a phenotype?	292-311
16	10/01	How is DNA faithfully copied in cells?	312-332
17	10/03	How is DNA information transcribed into RNA?	333-345
18	10/06	How is RNA information translated into protein?	345-359
	10/06	**EXAM 1 (classes 1-15)**	
19	10/08	**In-Class Discussion Session 4**	
20	10/10	How is gene expression regulated in bacteria?	360-365
21	10/15	How is transcription regulated in eukaryotes?	365-373
22	10/17	How do RNA molecules regulate transcription and translation?	374-376
23	10/20	How does a cancer form in an animal?	383-391
24	10/22	**In-Class Discussion Session 5**	
25	10/24	How do viruses infect cells, replicate themselves, and remain latent inside cells?	392-407
26	10/27	How is DNA sequenced, how are genes cloned, and how is gene expression measured?	408-421
27	10/29	**In-Class Discussion Session 6**	
28	10/31	How is the function of a gene determined, and how are stem cells generated and used?	421-435
29	11/03	How is a genome sequenced and how are its genes systematically analyzed?	436-447
30	11/05	What are the genetic differences between two individuals of a species and how do genomes evolve?	448-456
31	11/07	How is a diploid cell formed by gamete fusion and how does the early animal embryo develop?	1037-1041, 376-383
32	11/10	How are the germ layers and the three	1041-1060, 457-458

		axes of an animal embryo established?	
	11/10	**EXAM 2 (classes 1-30)**	
33	11/12	**In-Class Discussion Session 7**	
34	11/14	How are embryonic segments and specific tissues constructed during animal development?	1041-1060, 457-458
35	11/17	How do plant cells divide, expand, and form specific shapes such as leaves?	751-777
36	11/19	**In-Class Discussion Session 8**	
37	11/21	How do plant cells synthesize carbohydrates from carbon dioxide, water, and light?	185-205
38	11/24	How are plant processes coordinated by hormones?	836-849
39	11/26	How do plants make flowers and undergo sexual reproduction?	815-835, 849-855
40	12/01	How are nutrients, water, and various signaling molecules transported between parts of a plant?	778-798
41	12/03	How do plants cooperate with soil microorganisms to obtain nutrients?	799-814, 855-859
42	12/05	How do plants resist stress and pathogens?	859-865
		FINAL EXAM (classes 1-42)	

Evaluation:

Except for the first three classes and all Discussion Sessions, there will be on-line review/preparation quizzes before each class. The four questions in each pre-class quiz will cover material discussed in the preceding class plus knowledge gained by reading assigned material for the upcoming class. Clicker-based assessments will be given in class. Although no grade is given for clicker responses, each student answering at least 80% of all in-class clicker questions will have eight points added to their overall pre-class quiz score. There will be two 2 hr exams during the semester and one 3 hr final: all are cumulative exams.

The pre-class quizzes are open-book/open-notes, closed-internet (for example, no Google-type searching is allowed) and can be taken together with other students in the class, freely discussing all relevant material with each other at any time before or during the taking of the quiz. Each quiz can be taken up to three times and only the highest grade is recorded. Deadline for finishing each quiz is 1 AM on the day of the respective class.

No notes or book material or other aid is allowed while taking exams. Students are expected to take all three exams at the scheduled dates and times in the same room as the class (typically Keck 100); note that midterm exams are in the evening. No make-up exams will be offered. Participation

is required for all in-class Discussion Sessions. Any paper submitted by a student must be written by that student (plagiarism is an honor code violation), but students are free to seek critical input on drafts of any paper from any third party.

Grade expectations:

All assessments except the Discussion Group grade will be graded according to a curve based on performance of the entire class. For each student, their final grade for the course will be calculated as the average of grades on pre-class quizzes, midterms, Discussion Group performance, and Final Exam.

Reminder:

Participation in all in-class Discussion Sessions is required to pass Bios 201. If you cannot be present for a discussion group session due to travel or illness, you must contact your discussion group leader and me before the session meets.

Clickers:

You need a i>clicker (ISBN 0716779390 or 1464120153) for this course that can be obtained from the Rice bookstore, various online sources, or used from other students. You will register your clicker ID in class.

Special Note:

Any student with a disability requiring accommodations in this class is encouraged to speak with me within the first two weeks of class and also contact the Director of Disabled Student Services in the Ley Student Center.